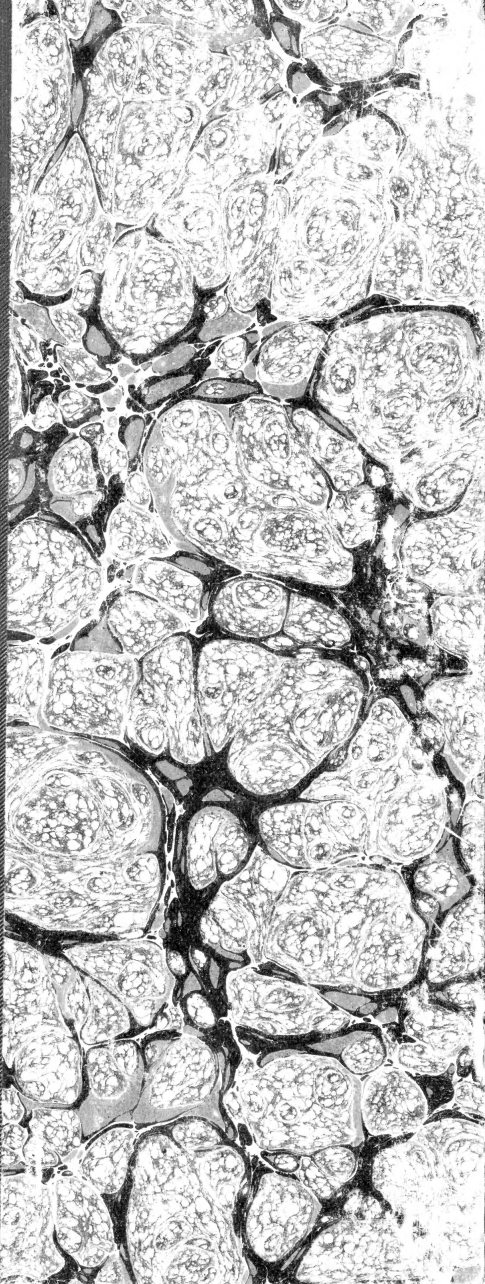


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CHICKENS.

How to Feed.

BY

W. VALE, F.Z.S.,

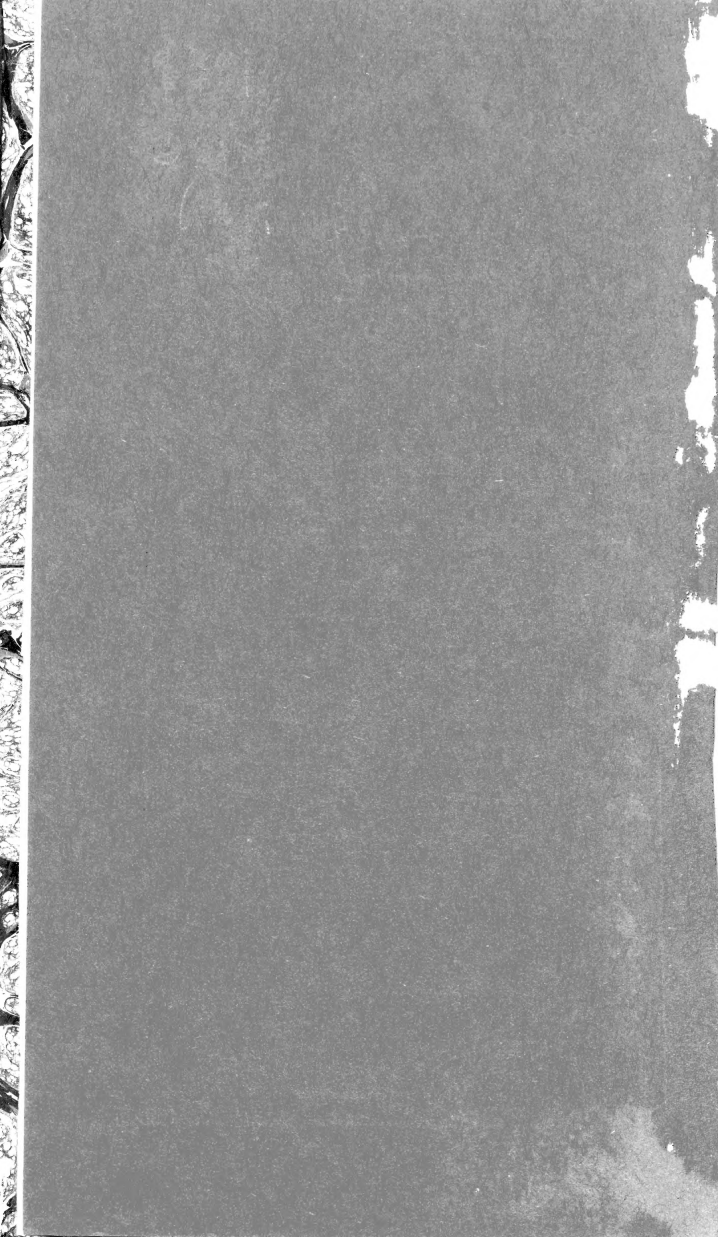
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Preface.

As regards the raising of chickens, it is fairly certain that during recent years there has been a higher rate of mortality amongst them than there was thirty years back, and one would very naturally expect just the reverse to be the case, because during recent years there has been much greater attention paid to the rearing of them than previously. There, too, has been very great improvement in the housing of them, and also in their sanitary conditions and general environments. Then wherein lies the cause of the recent high rate of mortality amongst chickens in the shell, and amongst those hatched? In order to make evident the cause of the present high rate of mortality amongst chickens, and to show how to prevent it, this booklet has been written.



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Introduction.

The information contained in this booklet is founded on a bedrock of indisputable facts, information acquired during an extensive experience in the examination of dead chickens and other creatures, and a prolonged study of the nature of foodstuffs and the effect of various systems of feeding. It is also founded on a knowledge of the composition of all natural diets—that is, diets provided by Nature. With this brief introduction, I leave the matter in the following pages for the careful consideration of the reader.



Function of Food.

All living bodies are continually being acted on by physical agents which cause loss of their tissues, and it is the function of food to replace this loss, build up the body, and provide for the reproduction of the species. In order that this may be done without injury to any organ of the body, a fairly balanced diet is necessary—that is, a diet containing all the necessary elements in about the right proportions. However, that which is of the most importance is the avoidance of an excess of those substances which, when in excess, overtax and impair any of the important organs of the body, and consequently prevent them efficiently performing their natural functions.

Digestion and Nutrition.

All substances swallowed first rest in the crop of a chicken or fowl, and the crop is merely an enlargement of the gullet, down which food passes from the mouth to the stomach. The length of time that food remains in the crop depends upon the rate of digestion, the crop being like a hopper supplying the stomach and gizzard with successive quantities of its contents for conversion into a more or less nutritive pulp. The crop empties itself into the

stomach, which is supplied with numerous glands which secrete and pour out a fluid which softens most substances, and prepares them for the action of the gizzard, besides assisting in other ways the process of digestion. The gizzard, in addition to grinding its contents, presses and forces the most fluid portions through a valvular opening into the intestines. There bile and other secretions which assist in the process of digestion become mixed with the pulp from the gizzard, the greater portion of which is eventually converted into a more or less nutritive fluid ready for absorption into the blood. This should circulate freely through every tissue and gland in the body, and each should extract from it the necessary quantity of material for maintaining it in a high state of efficiency. Thus we see that the blood and all other secretions are formed from the substances swallowed, and any substance in minute particles in a fluid may be absorbed into the blood in quantities which, if continuous, may eventually be the cause of death, even though the substance may be an element of food. This is because an element which is present in excess of the quantity required may overtax certain organs, or become deposited in them to such an extent as to prevent them efficiently performing their

natural functions. Besides, a substance may be very suitable in limited quantities, such as common table salt, which is a powerful irritant when in excess. This makes it very evident that a fair knowledge of the constituents of all ordinary foodstuffs, and the nature and effect of each, is very necessary in order that chickens and other poultry may be suitably fed. In my book, "Profitable Poultry," there is an easily understood table of the constituents of all ordinary foodstuffs, and it is a reliable guide to the selection of a diet suitable for chickens and other poultry under all circumstances.

Feeding Stock Poultry.

In order that chickens may be most successfully reared, it is necessary for the fowls which produced the eggs from which they were hatched to have been suitably fed, that is, for there to have been about the right proportion of the most important constituents of food in their diet. In order to be able to select a diet most nearly containing the necessary elements, it is necessary for one to know what are the most important constituents of all *natural diets*, and their proportions to the whole bulk of the diet. A chicken is formed from the white of an egg and the yolk of it forms its first diet to last it for the

first 24 hours after it has emerged from its shell, during which time it thrives—never better. *I have a chicken that lived and ran about for ten days, and I have the whole of the yolk of the egg from which it was hatched*, which anyone who has any doubt about a chicken being formed from the white of an egg is welcome to inspect. It is much better to allow chickens to remain 30 hours without being fed after they have emerged from their shells than to feed them much under 24 hours. In yolk of egg, the first diet of chickens, 31 per cent. of the *solids* are flesh-forming elements. In flesh, the sole diet of carnivorous creatures, there is more than 50 per cent. of flesh-forming elements in the solids, and in fish, the sole diet of a vast number of creatures, there is quite as great a percentage. In milk, the first diet of mammals, 28 per cent. of the solids are flesh-forming elements; therefore, the lowest percentage of flesh-forming elements in the *solids* of any *natural diet* being 28 per cent., it is but reasonable to arrive at the conclusion that, at least, nearly 28 per cent. is required in the diet of any poultry not being fattened. In the cereals, barley, wheat, maize, oats, rye, dari, and other kinds of millet, and also buckwheat, there is not an average of 12 per cent. in 86 per cent. of solids, and in no natural diet is there ever 50

per cent. of solids. These facts make it very evident that the cereals, or other dry grain feeds should not form more than a small proportion of the whole bulk of the diet of stock poultry, and they are more unsuitable in the case of chickens. However, that which makes the cereals, biscuitmeal, barley-meal, and suchlike foodstuffs most unsuitable is the large percentage of starchy matter in them which amounts to an average of more than 60 per cent., and money spent in purchasing an excess of it is far worse than wasted when it is fed to stock poultry, because it is the chief predisposing cause of disease, and failure in the raising of chickens from their eggs. Starchy matter, like fat, cannot form one atom of muscular tissue on which strength and vigor depend; it can only be burnt up to supply heat, and with the following vastly important difference, that is, when fat is burnt there is not any residue, but when starchy matter is burnt in the fiercest fire there is a residue of ashes—earthy salts, and when supplied to any creature in excess there is a residue of earthy salts, and cheesy fatty matter which becomes stored in important organs and is the chief predisposing cause of disease, and failure in the management of poultry to the best advantage. The great aim in feeding stock poultry

should be the avoidance of an excess of starchy matter, or solids. The great bulk of the diet should be soft food with a fair allowance of animal matter, and for grain feed it is advisable to use peas, and, as a change, maize and oats may be fed to the birds. I have not fed any grain to my chickens or fowls for more than nine months, and they have never previously done so well. Their diet has consisted of one part of "Superfex" meal to four of middlings, that is, the dressings from wheaten flour, scalded with the liquor from boiling meat for dogs. The food is prepared from 12 to 48 hours before it is fed to the fowls. The fowls have no grass, or other green food, being kept in houses with covered runs, the total ground space in each pen being not more than 60 square feet.

Feeding Chickens.

First Week.—It has been pointed out that chickens should not under any circumstances be fed before they have been out of their shells at least twenty-four hours; and, when fed, the food at first supplied to them should, as regards the proportion of nourishment and moisture in it, be in composition nearly the same as their previous diet, yolk of egg, supplied by the unerring laws of Nature, which

alone favour the survival of the fittest ; and those managed most nearly in accordance with such laws are the most likely to survive. It has been pointed out that yolk of egg, milk, meat, and fish are natural diets, and that in composition they are very much alike, and it being so makes it very evident that these foodstuffs are the most suitable ones for feeding to chickens, and more especially during the first week. After the milk of the dam, a variety of mammals live and thrive almost exclusively on juicy vegetable ; therefore, it is very evident that juicy vegetables may form a portion of the diet of chickens, and more especially when any dry food is being fed to them as a part of their diet. By feeding with egg, milk, meat, other animal matter, and juicy vegetable, an exceedingly varied diet may be supplied by blending these in addition to feeding them to the chickens separately. As regards egg as a food, so far no mention has been made of the white, in the solids of which there is far more nourishment than in the yolk ; but there are less solids in the white, so that, in feeding value, in equal bulk they are about equal. However, all the fat of an egg being in the yolk, some fatty matter is necessary to make a balanced diet of the whole bulk of an egg ; therefore, at the same time that

egg forms a portion of the diet, some extra fat is necessary for to make up for the deficiency of it in the white, and this can be supplied by feeding to the chickens some fat meat. Egg nicely cooked, some meat, or other animal matter containing fat, and some cooked, juicy vegetable, would be very suitable for feeding to chickens during the first week of chickenhood. In addition, they may have milk, buttermilk, or whey to drink. They may have custard made with egg and milk, also curds, a little porridge made with oatmeal, or middlings, with added milk, and also some cooked vegetable, but not much of this during the first week.

Second Week.—It is not necessary to continue the egg after the first week if quite as long; but it is a great advantage to give the chickens a good start in life at a little extra expense, which would in the long run be well repaid. It is necessary to continue to give them some meat or other animal matter, such as maggots, which may be germinated easily as advised in my book, "Profitable Poultry." Meal worms may also be propagated, and it is surprising how few keepers of poultry adopt the simple methods necessary for the propagation of insect life, which is so very suitable, especially for chickens. When they are over a week old, chickens may have soft food made

with one part of "Superfex" meal and four or five of middlings, which must be scalded and then left to soak for at least twelve hours, or, better still, twenty-four, before the food is fed to the chickens. It would be a good plan to add a little extra meat to that in the meal to the soft food. The scalding and soaking is very necessary to soften the woody fibre in the dressing from wheaten flour, which would irritate the mucous membrane of the bowel of young chickens or poultry if not scalded and soaked for a considerable time. There is not only the disadvantage of causing looseness, but a very considerable proportion of the food eaten is passed in a more or less undigested state through irritation of the mucous membrane of the bowel. When the excrement cakes round the vents of chickens, it is evidence of their food being passed in an undigested state, together with mucus from the coat of the bowel. Food long prepared may become sour, and there is the very erroneous impression amongst keepers of poultry that sour food is injurious, but on the contrary it is beneficial, even to very young chickens. The small quantity of acetum (vinegar) formed in fermented soft food is only sufficient to prove beneficial, because it is tonic in its action, aids digestion, and prevents putrefaction—that is,

the rotting of the food. Rotten food would prove injurious. With my Krekodyne Powder I order vinegar, not because it is necessary, but on account of its tonic and beneficial action in aiding the process of digestion. Instead of scalding the meals used in forming the soft food for chickens, they may be cooked and made into a stiff porridge, and then fed to them as soon as cool enough for them to devour. Last year I reared my chickens on soft food alone, with a large allowance of meat and other animal matter, including egg, milk, and a limited quantity of maggots, but I did not begin to give them the "Superfex" meal until they were rather over a week old. Before that they had porridge, custard, minced meat, etc., and I did not lose a single chicken, except a lot taken by rats. I have all those which I hatched now, except a large proportion of cockerels which were killed for table use. That which has surprised me most has been the firmness of the excrement from the birds, since they have only had soft food, the pullets continuing to grow after they had commenced to lay, their firmness of flesh and tightness of feather. I have been least surprised at them continuing to grow after they had commenced to produce eggs. I know that feeding too exclusively

with dry foodstuffs has a tendency to stunt the growth of chickens, and that is why breeders of bantams have been accustomed to feed to a great extent with dry food long before the present craze for dry feeding had become so prevalent. I do not think that it is advisable to give much cooked or uncooked, juicy vegetable to chickens fed with soft food, because it has a tendency to cause them to become too relaxed. When so successful in rearing them last year, they had very little juicy vegetable; but the previous year, when my chickens were fed to a very great extent with "dry feed," they had a considerable quantity of juicy vegetable, and I lost nearly the whole of them after they were about fully grown, and all those that died were the subjects of disease of their kidneys, the result of there being an excess of earthy salts and amyloid matter in their diet. After the second week the chickens may be fed with the same class of soft food that is suitable for fowls kept for breeding from, and they may have some dry food; but the cereals should be avoided—that is, wheat (especially large wheat, whether broken or not), barley, maize, rye, dari, and other kinds of millet, canary-seed, etc. Strange as it may seem, the larger the wheat the more unsuitable it is for feeding to chickens or other

poultry. Instead of feeding with cereals it is advisable to feed with pulse—that is, peas, beans, or tares, which contain an average of more than twenty per cent. of flesh-forming elements. Peas are the most suitable, especially for feeding to chickens, and they may be broken and graded to suit all sizes. In feeding value, one bushel of peas is equal to two of mixed cereals or any “dry feeds” that I have seen on the market, and most kinds have been sent to me with chickens sent for post-mortem examination. In peas there is about twenty per cent. of flesh-forming elements, and only about 55 per cent. of starchy matter, but in two bushels of cereals there is only about 20 per cent. of flesh-forming elements, and about 120 per cent. of starchy matter, which is at least 60 per cent. too much, and the money spent in purchasing the excess is far worse than wasted, because it is the chief predisposing cause of disease and failure in hatching and rearing chickens. It is not ever advisable to feed any bone-meal or freshly-cut bone (known as green bone) to chickens, because there is an excess of lime-salts and phosphates in grain and seeds. About twenty years back I had a number of chickens sent to me from time to time, and I failed to be able to find out the cause of

them dying until the lady stated that she was giving them Parish's so-called chemical food, and then, and not until then, I examined their bones, which were very acutely inflamed owing to them having an excess of phosphates. Since then I always examine the bones of dead chickens, and I have met with many similar cases, and the chickens have ceased to die soon after the great excess of phosphates was discontinued. The phosphates or hypophosphates are not in any case suitable for chickens or poultry, and owing to being insoluble in water they can only be sent out in pill or liquid, usually in syrup. Some of the readers of this booklet may be inclined to ask the question: What is the use of poultry having that marvellously constructed organ—the gizzard—if they are to be fed almost exclusively with soft food? In a state of nature, and with wholly natural environments, poultry are almost omnivorous as regards the variety of foodstuffs which they consume, and under some circumstances they consume those in which the nutriment is intimately incorporated with hard fibrous substances, and the gizzard, with the aid of some gritty substances, is necessary to break them up in order that the nutriment may be extracted. Besides, in order for birds to obtain enough material for the

formation of the hard shells of their eggs, it is necessary for them to devour mineral substances containing lime-salts ; also harder substances to quickly grind up those containing the shell-forming material. Their food, too, requires to be ground into minute atoms, in order for the nutrient portions to be able to enter the blood-stream to nourish the tissues of the body and to provide for the reproduction of the species. It is certain that soft food can be much quicker and more thoroughly digested than any dry food, and growing chickens require to be able to digest a considerable quantity of food in order to promote *healthy development and size*. Then there is the fact that for a certain sum of money more muscle-forming matter can be purchased when purchasing material for forming soft food than when purchasing any dry food, and it is on the digestion of a sufficient quantity of muscle-forming matter that strength and vigour depend. The great points in feeding are the avoidance of an excess of starchy matter and solids, and providing this is done there is not any limit to the variety of foodstuffs that may be fed to chickens or other poultry.

Dry Feeding.

When one is aware that for many years the raising of chickens after they have been hatched has been becoming more and more generally unsatisfactory, one is not surprised at any new method of feeding advocated being very readily adopted, and more especially when it has the merit of less labour, and there is rather less labour attached to feeding with dry than soft food. However, on the whole there need not be much more labour in feeding with soft over dry food, and, even if there were treble the trouble, the great point to be kept in view is the future well-doing of the chickens and their progeny. The ill-effects of feeding with soft food composed wholly, or in part, of unsuitable material, or material unsuitably prepared, will become much sooner evident than the ill-effects of feeding with dry food. Amongst breeders of bantam fowls a system of dry feeding has been practised for many years in order to *keep down size*, which it certainly does, at the expense of muscular development and stamina. It also causes bantam fowls to become peculiarly liable to certain diseases, such as canker (roup of the diphtheritic type), disease of the kidneys, causing wasting, and egg binding, and I have found that owing to being too exclusively fed with

dry foodstuffs, bantams are much more difficult to cure than ordinary-sized fowls. Bantam fowls are also very subject to ossification of their cartilages, and, when not the result of old age it is the result of a course of feeding with a diet containing an excess of earthy salts, that is, more than is necessary, and more than can be got rid of by the kidneys and skin. It is when the skin is loaded with earthy matter that there is loss of gloss on plumage, disease of feather, the result of disease of skin, and unnatural moulting, that is, moulting out of season, or too slowly. Natural moulting is a very beneficial process for birds, and I may here state that an identical process takes place in snakes, fishes, and other creatures. The feathers of birds are but highly developed scales, and fishes cast their scales gradually, and snakes wriggle out of them in a mass, and at each moult take a new lease of life. As regards the ill-effects of feeding too exclusively with grain "dry feed," or any diet which contains an excess of earthy salts or starchy matter, it may not be noticed in one generation, or possibly two or three, but each succeeding generation becomes more and more unfitted to fight the battle of life and to propagate species that would be profitable to their owner. It is quite a common experience for one to have

keepers of poultry writing and saying that they never had such bad luck before, and yet they have fed their poultry the same as previously. They have failed to perceive that their birds were deteriorating each year. If fowls were kept until they died from disease or old age, their deterioration would be made very evident, because it would be found that instead of them living until their natural span of life was ended, at about the age of twelve years, very few would be found to arrive at that age, or even to half that age. Some years back there was an account in the papers of a duck having been shot in Sweden with a metal band upon its leg which had been placed on it in the Arctic regions 35 years previously to it having been shot. No doubt need be entertained as regards the great length of time it had lived being due to it having lived upon a suitable diet, to secure which it had had to travel over very long distances, and at times probably on a very scanty fare. It is fairly certain that but little, if any, of the food of a wild duck would be dry food, and that fat instead of starchy matter supplied it with animal heat. The effect of feeding too exclusively with grain is made very evident in the loss of colour in the legs of Leghorns and other yellow-legged birds, and it is the same as regards the loss of colour of plumage

in buff-coloured birds, especially after they are about a year old. I could fill pages in pointing out the ill effects of feeding too exclusively with grain and other dry foodstuffs, but will conclude by drawing special attention to the fact that the diet of all wild birds living in a state of nature, and with wholly natural environments, chiefly consists of juicy animal and vegetable matter, and more especially that of the young birds. In the case of those birds classed as grain and seed-eating, only a very small proportion of their diet consists of grain or seed, and a considerable proportion of that devoured, especially by their young, has commenced to germinate, and is in a more or less soft condition. In the nests of birds living in a state of nature, and with natural environments, there are not any unfertile eggs, or chickens dead in the shell, except when the nests have been deserted, but a vast number of the chickens of domestic poultry die in the shell or soon after they are hatched, and more especially during recent years. Many and various have been the theories set forth as to the cause, but none of them have been supported by facts. In a small percentage of the cases the fault may have been in the incubation of the eggs. On one occasion I examined 523 pheasant eggs which had been incubated under hens,

and under most excellent conditions as regards the prevalent temperature, moisture in the atmosphere, position, etc., of the nests, and general care, and had the keeper been successful one would have had no hesitation in attributing his success to good management. Of those 523 eggs only about ten per cent. were unfertile, the chickens having died in the shell at various stages of development, and many at an advanced stage. I have met with thousands of such cases, but never as many at one time, and I am quite certain that the chickens perishing in the shell at various stages of incubation is, as a rule, the result of the birds which produced the eggs having been fed with a diet which contained an excess of starchy matter, and was deficient in flesh-forming elements. There is never an excess of flesh-forming elements, or fatty matter, that is, pure fat, and the latter is made very evident when chickens are stuck to the shell. When chickens die in the shell at various stages of development in an incubator with say 60 eggs in it, and some hatch out satisfactorily, it is fairly certain that the fault does not lie in the incubating of the eggs, and this is made very evident when the eggs are being incubated under hens. Therefore under such circumstances the cause for the mortality must be sought in the eggs,

and if there, it must have had its origin in the fowls that produced the eggs. In some cases I have found that the mortality has been due to inherited germs of roup of the diphtheritic type ; therefore, it is not advisable to set the eggs of fowls suffering from that malady, but unfortunately owing to it in very many cases being in a latent condition in fowls, the inheritance of the disease by the chickens cannot always be avoided. The most common cause of chickens perishing in the shell is fatty-amyloid disease of the kidneys and liver, the result of the parent birds having been fed with a diet containing an excess of starchy matter. Of course, prevention of such cases lies in suitably feeding fowls kept for breeding from, from the shell right on year after year.

In conclusion, I must advise the reader not to be guided by anything but ascertained facts, taking Nature as a guide, and we may improve our poultry, as we can improve plants, by working according to her laws, which are unerring. In the long run we cannot violate Nature's laws with impunity.



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